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ACQUISITION,
TECHNOLOGY
AND LOGISTICS

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MEMORANDUM FOR CHAIRMAN, DEFENSE SCIENCE BOARD

SUBJECT: Terms of Reference – Task Force on DoD Energy Strategy

You are requested to form a Defense Science Board Task Force on DoD Energy Strategy.

Optimizing tactical performance often results in operational and strategic constraints. For example, the employment of external fuel tanks on fighter aircraft and at sea refueling enable platforms to expend energy as required for tactical performance. Although tactically beneficial, the tyranny of the tanker imposes operational and strategic constraints and incurs operational and strategic vulnerabilities which are open to exploitation. Additionally, the infrastructure required to transport and distribute energy to the battlefield is extremely costly and diverts resources away from combat capabilities. A previous Defense Science Board report calculated the actual cost of fuel delivered to be at least one to two orders of magnitude greater than the price charged to the Military Departments. Approximately 70% of the tonnage required to position today's U.S. Army into battle is attributed to fuel itself. Millions of gallons a day are critical for Naval operations. As the largest consumer, the Air Force spends over $4.7B/yr on aviation fuels. The artificialities of low price and easily developed work-arounds have blinded DoD to alternative energy design patterns and trades.

At a national level, DoD is the largest single user of energy in the United States. With an energy usage amount of a little over 1% of the nation's total, DoD short-term needs can readily be met by diverting energy resources from the civilian economy. However, even moderate disruptions to U.S. energy supplies severely impact the U.S. economy and potentially the DoD. Despite this known vulnerability, alternative energy supplies have not been economically viable.

While transportation/mobility fuels account for about 75 percent of the Department's total energy demand, review of the portfolio may yield significant rewards.

DoD Transformation initiatives provide a new opportunity to re-examine DoD energy usage practices. The Task Force should examine second and third order effects to determine if any strategic or operational imperatives exist to

revising DoD's Energy Strategies. For example, the primary savings from the DSB study on re-enginning the B-52H resulted from the reduced maintenance requirements and subsequent maintenance infrastructure associated with the more reliable engines. In addition to reduced maintenance, the increased range resulted in greater operational utility for the existing platform.

The Task Force should specifically identify strategic transition-opportunities inherently offered by technologies that have implications for energy and their systemic second- and third-order effects. It should also assess the extent to which these enable optimizing across strategic, operational, tactical, and lifecycle cost performance vectors; their commercialization potential; the implications for DoD's Energy Strategy; and impact on force structure and global posture. Institutional obstacles to implementation should be identified.

The Task Force will:

1. Identify DoD operational and strategic constraints and vulnerabilities created by optimizing tactical platforms and capabilities without regard to energy usage.

2. Identify programs and means for the DoD to reduce its energy demand, particularly on petroleum-based fuels. Identify supporting infrastructure requirements.

3. Identify and assess opportunities for the DoD to produce energy for its own use, (e.g. conversion of natural gas to liquids, and supporting infrastructure requirements).

4. Identify synergistic opportunities for renewable and alternative energy sources common to meeting both facility/infrastructure and transportation/mobility energy requirements.

5. Assess second and third order effects that may create opportunities for the DoD to transition to a new energy strategy. Identify metrics which may be used to trade short and long term benefits and true costs. Identify processes for determining true costs across the entire life cycle.

6. Identify potential technologies to assist in the DoD transition. Assess the ability of the DoD to transition these technologies into commercially viable enterprises for possible incorporation into a national energy plan designed to achieve some level of energy independence.

7. Assess the impact of the proposed strategy on force structure and the Department's global defense posture realignment effort.

a. Examine implications of alternative energy approaches for forward stationing and rotational presence of warfighting and support units.

b. Assess tradeoffs and possible synergies between these alternatives and other mobility/logistics approaches (e.g. sea-basing, high speed connectors, enhanced en route infrastructure) and ISR projection capabilities that may enable key operating patterns of our joint forces.

8. Identify institutional/organizational barriers to this transition.

The Task Force will report any interim findings and recommendations as the opportunity permits to the 2006 Summer Study on 21st Century Strategic Technology Vectors.

The study will be sponsored by me as the Under Secretary of Defense (Acquisition, Technology and Logistics), Director, Defense Research and Engineering and the Acting Director, Defense Systems. Dr. James R. Schlesinger and General Michael P.C. Carns, USAF (Ret), will serve as the Task Force co-Chairmen. Mr. Chris DiPetto, Defense Systems, and Mr. Jack Taylor, Defense Research and Engineering will serve as the Executive Secretaries. Major Charles Lominac, USAF will serve as the Defense Science Board Secretariat representative.

The Task Force will operate in accordance with the provisions of P.L. 92-463, the "Federal Advisory Committee Act," and DOD Directive 5105.4, the "DoD Federal Advisory Committee Management Program," It is not anticipated that this Task Force will need to go into any "particular matters" within the meaning of Section 208 of Title 18, U.S. Code, nor will it cause any member to be placed in the position of acting as a procurement official.

Kenneth J. Krieg